FULL CONTENTS

[Claim(s)]

[Claim 1][both ends of two or more tubes which set a predetermined interval and are arranged at a parallel state] It is inserted in two or more tube insertion holes installed successively by each circumferential side wall of a pair of hollow headers along the length direction, Carry out insertion arrangement of the end part of some tubes of all the tubes which are the assembling methods of a heat exchanger skeleton in which a tube and a header were put together, and are used for an assembly in one tube insertion hole of one headers, and. Carry out insertion arrangement of the end part of some [other] tubes in one tube insertion hole of the headers of another side, make a header hold to a pair of header receptacles arranged on both sides of tube Rough Guide at both sides, and. said -- both, [some tubes] [the state where it inserted in a tube inserting part to which tube Rough Guide corresponds] [arrange and] In [combine, arrange in the state where the remaining tubes were inserted in a tube inserting part of tube Rough Guide, and] after [appropriate] and its state, An assembling method of a heat exchanger skeleton inserting both ends of all the tubes in a tube insertion hole of both headers by making both header receptacle approach relatively.

[Detailed Description of the Invention]

[0001]

[Industrial Application]metal heat exchangers, such as aluminum by which this invention is used for the condensation machine for car air conditioners, a radiator, an intercooler, etc., -- in detail, It is related with the assembling method of the heat exchanger skeleton which is assembled by the both ends of two or more tubes called what is called a multi-flow or a parallel flow in manufacture of the heat exchanger of the type which connected a pair of hollow headers to the free passage state and which combined the tube and the header.

[0002]
[Description of the Prior Art]As shown in Fig. 5, [as a condensation machine for recently for example, car air conditioners, etc.] Two or more flat tubes (1) arranged at a parallel state -- A pair of hollow headers (2) and (3) are connected to a free passage state to both ends, Tube (1) -- It is in the tendency used by preference in between by the multi-flow type heat exchanger made from aluminum which has the basic composition by which a fin (4) is arranged as what can realize high-fever exchange performance, a low-pressure power loss, and super-miniaturization.
[0003]Manufacture of this heat exchanger manufactures the heat exchanger skeleton (5) which generally combined the header (2) and (3) with tube (1) -- as first shown in Fig. 4, Other fin (4) and heat exchanger members forming is attached to this skeleton (5), and it is carried out by arranging the heat exchanger assembly object of this trial fitting state in a soldering furnace, and carrying out the junction unification of the whole by package soldering.
[0004]And although manufacture of the above-mentioned heat exchanger skeleton (5) is performed by inserting the both ends of a tube (1) into the tube insertion hole installed successively by the circumferential side wall of a header (2) and (3) in the length direction, [manufacture] In order to perform this well, as conventionally shown in Fig. 6, insert tube (1) -- in the inserting part (51a) of tube Rough Guide (51), hold in the parallel state, and. . [the header receptacle (52) and (53) arranged at the both sides of this tube Rough Guide (51)] The header (2) and (3) is arranged in the state where the tube insertion hole (2a) (3a) was turned to the inner direction, The appropriate back carried out relative approach of the header receptacle (52) and (53), and the method of inserting the both ends of all the tubes (1) in the tube insertion hole (2a) (3a) of both headers (2) and (3) collectively was taken.
[0005]
[Problem to be solved by the invention]However, in the above insertion methods. [the header (2) and (3)] It is difficult to make the header receptacle (52) and (53) receive the tube insertion hole (2a) (3a) in an exact for [inner] state, It is difficult also for holding the exact for [inner] state, by the time it inserts the end of a tube (1) after winning popularity, and The sake, Even if it carries out relative approach of the header receptacle (52) and (53), well, they are not inserted in the tube insertion hole (2a) (3a) of a header (2) and (3) by the both ends of a tube (1), but. [depending on the case] It also happened to damage and change the end of a tube (1) and the circumference of the tube insertion hole (2a) (3a) of a header (2) and (3).
[0006]This invention can cancel the above conventional faults, and can insert tube both ends in the tube insertion hole of a header certainly, and an object of the invention is to provide the assembling method of the heat exchanger skeleton which can attain certain-ization of translucent assembly work.
[0007]

[Means for solving problem][in the above-mentioned purpose] [this invention] [the both ends of two or more tubes which set the predetermined interval and are arranged at a parallel state] It is inserted in two or more tube insertion holes installed successively by each circumferential side wall of a pair of hollow headers along the length direction, Carry out insertion arrangement of the end part of some tubes of all the tubes which are the assembling methods of the heat exchanger skeleton in which the tube and the header were put together, and are used for an assembly in one tube insertion hole of one headers, and. Carry out insertion arrangement of the end part of some [other] tubes in one tube insertion hole of the headers of another side, make a header hold to a pair of header receptacles arranged on both sides of tube Rough Guide at both sides, and. said -- both, [some tubes] [the state where it inserted in the tube inserting part to which tube Rough Guide corresponds] [arrange and] In [combine, arrange in the state where the remaining tubes were inserted in the tube inserting part of tube Rough Guide, and] after [appropriate] and its state, Let the assembling method of the heat exchanger skeleton inserting the both ends of all the tubes in the tube insertion hole of both headers be a gist by making both the header receptacle approach relatively.

[0008]

[Function]In a described method, change into the state where some tubes were inserted in the tube insertion hole, and a header receptacle is made to receive a header, and -- this -- since some tubes shall be inserted in the inserting part of tube Rough Guide, setting maintenance of the tube insertion hole of the header in a receptacle is automatically carried out in the exact for [inner] state. Therefore, if both the header receptacle is made to approach relatively in the state where inserted the remaining tubes in Rough Guide and they have been arranged, the both ends of all the tubes will be certainly inserted in the tube insertion hole of both headers, without causing trouble.

[0009]

[Working example]Next, the embodiment of this invention is described.

[0010]First, when the skeleton assembling device used for operation of this invention method is explained based on Fig. 2 and Fig. 3, tube Rough Guide, (9), and (10) are header receptacles in which (7) has been arranged at the work pedestal and (8) is arranged at both the sides of tube Rough Guide (8).

[0011]Tube Rough Guide (8) is what is arranged on a work pedestal (7) at a fixed state, Set a prescribed interval, and it is provided in the upper surface by the inserting part (8a) of two or more sections prolonged in the concave horizontal direction of the width corresponding to tube thickness at a parallel state, and, [this inserting part (8a)] The plug state is held in the tube (1) inserted in this, and a slide in the length direction is permitted.

[0012]In the position on the left-hand side of tube Rough Guide (8), as a left-hand side header receptacle (9) meets this, it fixes on a work pedestal (7) and it is arranged. It consists of

combination of the piece of this receptacle of the upper and lower sides of the length corresponding to [win popularity and / abbreviated] header length in (9) (12), and (13), they are connected on a hinge, and the piece of an upper part receptacle (12) is made as [open / from the tube Rough Guide (8) side]. And the crevice for header arrangement of the shape of a section semicircle prolonged in the length direction (12a) (13a) is provided in the cross direction center of the opposed face of the piece of both receptacles (12), and (13). [the side edge part by the side of tube Rough Guide (8) of the piece of both receptacles (12), and (13)] Crevice (12b) --(13b)-- for tube insertion for the outside by the side of Rough Guide (8) inserting a tube end into the crevice for header arrangement (12a) (13a) from a way, where the up-and-down piece (12) and (13) of a receptacle is closed is installed successively. This header receptacle (9) is adjoined and a pair of control (14) which presses down the piece of an upper part receptacle of a closed state (12) from the upper part, and (14) are provided.

[0013]In the position on the right-hand side of tube Rough Guide (8), the right-hand side header receptacle (10) is arranged so that this may be met.

It was symmetrically constituted with the left-hand side header receptacle (9), and consists of combination of the up-and-down piece of a receptacle (15), and (16), In points -- they are connected on a hinge, section semicircle-like the crevice for header arrangement (15a) (16a) is provided, crevice (15b) --(16b)-- for tube insertion is installed successively, and contiguity arrangement of a pair of control (17) and (17) is carried out -- It has the same composition as the above-mentioned left-hand side header receptacle (9).

However, on a work pedestal (7), a right-hand side header receptacle (10) is provided at a fixed state on the movable carriage (18) arranged enabling free movement to a horizontal direction, and sandwiches tube Rough Guide (8) by it, It is made as [perform / movement of approach and estrangement], holding a parallel state to a left-hand side header receptacle (9). (20) is a control lever for making a movable carriage (18) move.

[0014]this invention method is enforced as follows using the above-mentioned assembling device. That is, first, as shown in Fig. 2, it inserts in a tube insertion hole (2a) located in an endmost part of one header (2) in an end part of a tube (1). It inserts in a tube insertion hole (3a) located in an endmost part by the side of opposite [of a header (3) of another side] in an end part of a tube (1). And these headers (2) and (3) are arranged in a crevice for header arrangement (13a) of a piece of a bottom receptacle (13) of a header receptacle (9) on either side and (10), and (16) (16a), respectively, as shown in the Fig. 1 (**) and Fig. 3. And it combines with this, and the tube (1) and (1) inserted in the header (2) and (3) is inserted in an inserting part (8a) (8a) to which tube Rough Guide (8) corresponds, and is arranged. Thereby, tube insertion hole (2a) --(3a)-- of both headers (2) and (3) is set automatically as an exact for [inner] state, and holds the direction. And it changes into the state where closed and pressed down each piece (12) and (14) of an upper part receptacle, and the upper surface of a piece of

a both upper part receptacle (12) and (15) was pressed down by (14), (14), (17), and (17). It may be made to insert an end of one tube each (1) and (1) in a tube insertion hole (2a) (3a) of each header (2) and (3) in the state where received the header (2) and (3) and it was made to receive in (9) and (10).

[0015]And as shown in the Fig. 1 (**) and Fig. 3, it is a tube (1) of all the remainder. -- Each tube inserting part of tube Rough Guide (8) (8a) -- It inserts inside and arranges.

[0016]As shown to Fig. 3 by the arrow in the appropriate back, when a control lever (20) is pushed and the right-hand side header receptacle (10) is moved to left-hand side, [the end of each tube (1)] it entering in a header receptacle (9) and (10), and through the tube insertion crevice surrounded by the up-and-down crevice for tube insertion (12b) (13b) (15b) (16b) at the opposed face side of a header receptacle (9) and (10), As shown in the Fig. 1 (**), the both ends of all the tubes (1) are inserted in each tube insertion hole (2a) --(3a)-- of both headers (2) and (3), and are assembled by the skeleton (5).

[0017]Then, it presses down, (14), (14), (17), and (17) are removed, the piece (12) and (15) of an upper part receptacle of a header receptacle (9) and (10) is opened, and a skeleton (5) is taken out.

[0018]Although the number of the tube (1) beforehand inserted in each header (2) and (3) was made into one in the above-mentioned embodiment, it may be made to insert several tubes beforehand. The insertion point of a pre-insertion tube (1) is not limited to the tube insertion hole (2a) (3a) located in the endmost part of the above headers (2) and (3), either, and it may be made to insert it in the suitable tube insertion hole located in an intermediate part. Arrangement of the header (2) to an assembling device and (3) and arrangement of the remaining tubes (1) may perform any first.

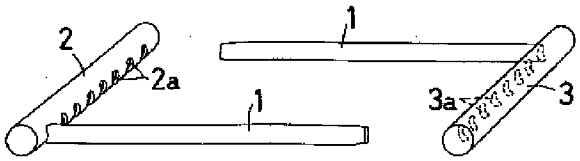
[0019]

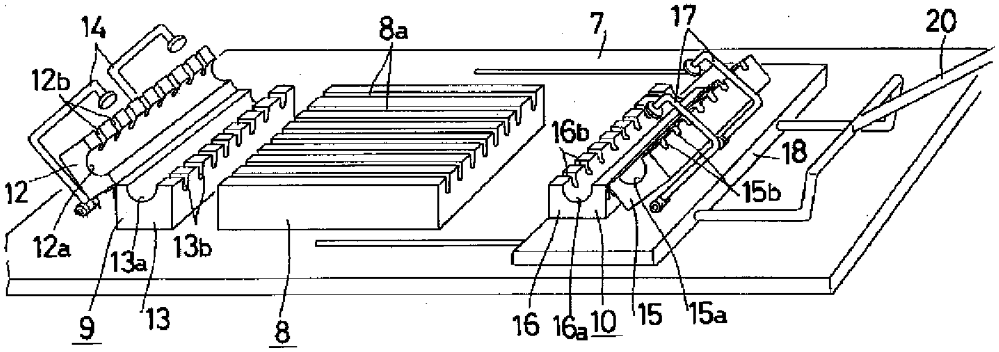
[Effect of the Invention]By above-mentioned order, [the assembling method of the heat exchanger skeleton of this invention] Carry out insertion arrangement of the end part of some tubes of all the tubes used for an assembly in one tube insertion hole of one headers, and. Carry out insertion arrangement of the end part of some [other] tubes in one tube insertion hole of the headers of another side, make a header hold to a pair of header receptacles arranged on both sides of tube Rough Guide at both sides, and. said -- both, [some tubes] [the state where it inserted in the tube inserting part to which tube Rough Guide corresponds] [arrange and] In [combine, arrange in the state where the remaining tubes were inserted in the tube inserting part of tube Rough Guide, and] after [appropriate] and its state, Since it is made with what inserts the both ends of all the tubes in the tube insertion hole of both headers by making both the header receptacle approach relatively, Setting maintenance can be automatically carried out in the for [inner] state with an exact tube insertion hole of both the headers that were able to be received in the header receptacle, therefore the both ends of all

the tubes can be certainly inserted in the tube insertion hole of both headers, and certain-izing of translucent assembly work and increase in efficiency can be attained.

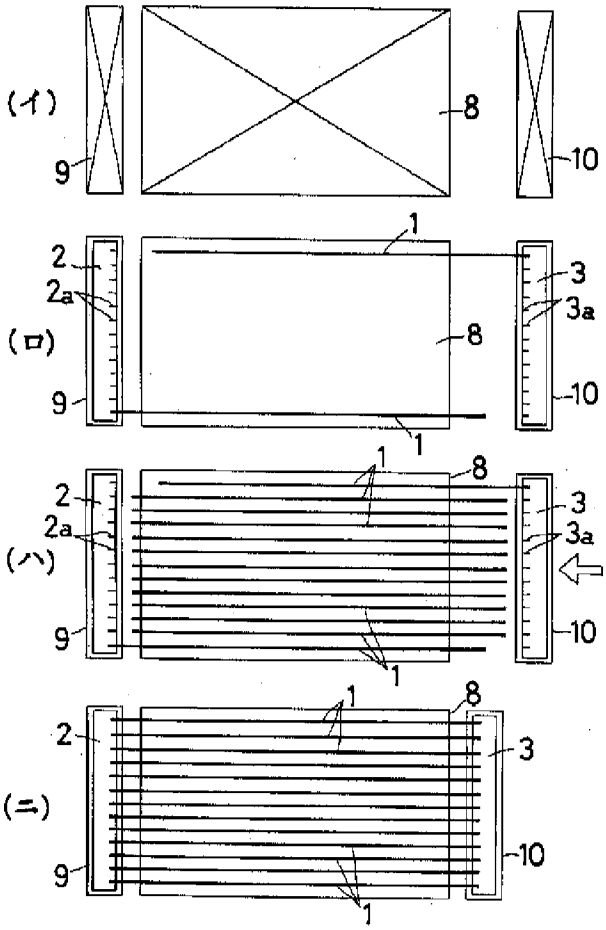
[Brief Description of the Drawings]
[Drawing 1]A translucent fabrication process is shown typically and figure (b) The top view of an assembling device, The top view in which figure (**)'s constructing the header which inserted the end of the tube in the tube insertion hole to an assembling device, and showing a ****** state, They are a top view showing the state where figure (**) built all the remaining tubes into the assembling device, and a top view showing the state where figure (**) moved the right-hand side header receptacle to left-hand side, and the both ends of all the tubes were inserted in each tube insertion hole of both headers.
[Drawing 2]It is the whole skeleton assembling device perspective view.
[Drawing 3]It is a perspective view of the device in which the state where the header and the tube were built into the assembling device is shown.
[Drawing 4]It is a perspective view of a heat exchanger skeleton.
[Drawing 5]Figure (b) is the whole heat exchanger front view, and figure (**) is the top view.
[Drawing 6]the conventional skeleton assembling method is shown -- it is a section side view in part.
[Explanations of letters or numerals]
1 -- Tube
2, 3 -- Header
5 -- Skeleton
8 -- Rough Guide
8a -- Inserting part
9, 10 -- Header receptacle

[Drawing 2]

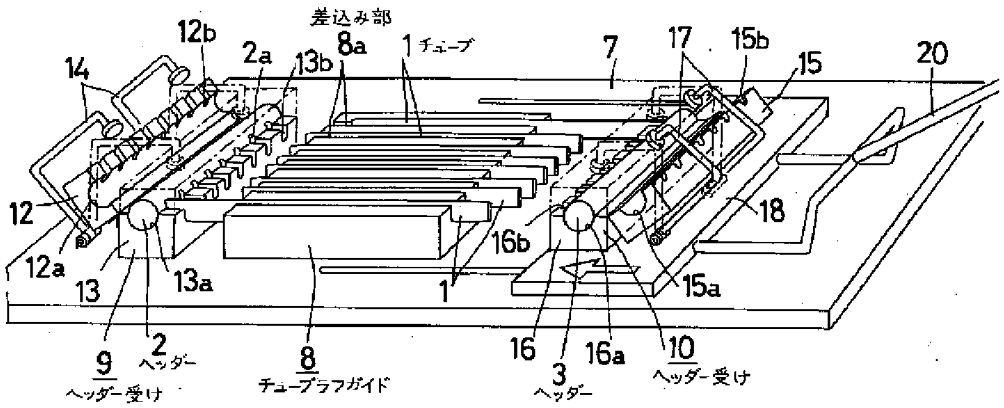




[Drawing 1]



[Drawing 3]



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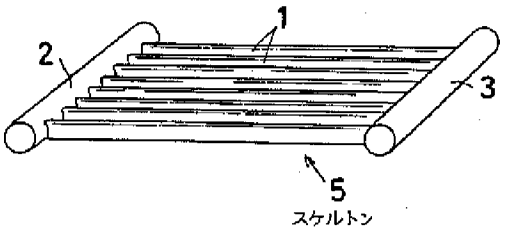

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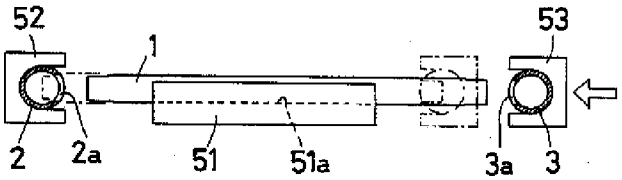
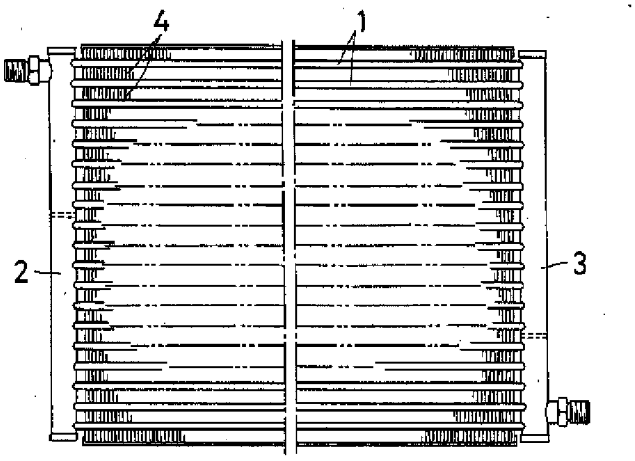


[Drawing 5]



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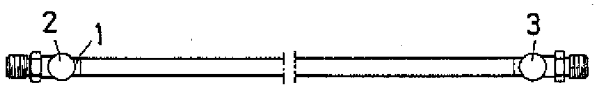

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[Translation done.]